SPRING/SUMMER 2003
DAM SAFETY UPDATE

A publication for New Hampshire Dam Owners

By the N.H. Department of Environmental Services Water Division, Dam Bureau

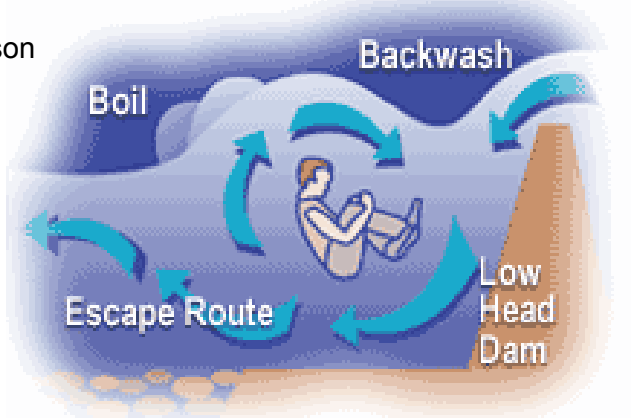
UNDERSTAND AND RESPECT THE DANGER ZONES NEAR DAMS

By Nancy McGrath

Last month, two inexperienced and ill-equipped kayakers intentionally tried to kayak through a breach in the flashboards of an 18-foot high dam in New Hampshire, ignoring safety fencing and warning signs. Both kayakers were thrown from their kayaks once they passed through the breach, and were trapped in the cold, rolling water at the tailwater of the dam. One kayaker never came up.

There have been numerous fatalities at dams throughout the country, but when incidents like this happen close to home, it reminds us of the dangers associated with the flow of water around dams and how attractive that danger can be to the public. A great many of you have seen what the force of water can do to earth or concrete on a dam. The force of water flowing over or through a spillway is extremely powerful, and generally can't be physically overcome by people.

As the water flows over the dam, it creates a circular pull of water towards the bottom of the dam. This is what pulls a person back towards the dam, then underwater and then around back towards the dam. Once caught in this "drowning machine," it's impossible to escape. Every year people are killed or seriously injured at dams. Most of these accidents could be avoided by simply staying clear of the restricted zones at dams, by understanding the dangers dams can create, and by obeying all warning devices. If you have visitors at your dam, make sure they understand the potential dangers.



SAFETY AROUND DAMS

- NEVER SWIM NEAR A DAM
- NEVER BOAT OR FISH ALONE WHEN NEAR A DAM
- ALWAYS WEAR A PERSONAL FLOATATION DEVICE WHEN NEAR WATER
- ALWAYS HEED AND OBEY DAM WARNING SIGNS

CRITICAL AREAS NEAR DAMS ARE:

- Slippery surfaces on dams and shorelines
- Submerged hazards above and below dams
- Open spillways that may not be visible from upstream of the dam
- Hazard areas marked by buoys
- Discharge areas
- Strong unpredictable currents above or below the dam
- Deceiving reverse currents below spillways
- Debris passing over or through the dam
- Ice that forms near a dam which is often thin and unsafe

Private Dam Owner Tackles Principle Spillway Repair Project

By Grace Levergood

During the fall of 2000, the dam owner of the Academy Brook II Dam, a privately owned earth filled masonry dam in Gilmanton, took on the challenging task of repairing the principle spillway in his dam. This 15' high, low hazard dam impounds a 2-acre pond and is 165 feet in length. The drop inlet riser and outlet pipe, made of corrugated metal (CMP), were badly corroded and required either complete replacement or re-lining.

The CMP principle spillway had been installed during the late 1980s by the former dam owner. The life expectancy of corrugated metal spillways has been shown to be approximately 20 years. After that time, an internal inspection of the system is highly recommended to detect possible corrosion problems and schedule repair or replacement.

After consulting with DES to inquire whether permits would be required for the work, the dam owner obtained the services of Picco Enterprises, Inc., a local grouting contractor. The alignment and interior condition of the existing 36-inch CMP outlet pipe was determined to be straight and rigid enough such that lining with a smooth high density polyethylene (HDPE) pipe could be accomplished. The interstitial space between the two pipes was pressure grouted. The work was accomplished from the top of the dam using a backhoe and chain to slide the 40-foot long, 30-inch interior dimension (I.D.) liner pipe into the old CMP pipe. Due to the improved flow characteristics of the HDPE pipe, the discharge capacity of the lined pipe was not significantly reduced negating the need for a DES dam reconstruction permit.

With the impoundment drained through the dam's low level outlet, the upstream corroded CMP riser was manually replaced with a new section of CMP pipe. The new pipe was secured to the metal collar in the existing concrete box chamber, which serves as the connection between the vertical riser and the horizontal outlet pipe and houses the low-level outlet. Additional pressure grouting work was performed into the masonry dam to strengthen the structure and seal areas of seepage noted previously at the toe of the dam.

The entire project took approximately one week to complete at a cost of $16,000 for the dam owner. Early detection and proper planning proved worthwhile in this case and has extended the life of this classic New England style dam for years to come. John Funk, the dam owner, welcomes any questions regarding this project. He may be reached at (508)267-8587.

Updating your Emergency Action Plan Just Got Easier

By Bethann McCarthy

A new webpage has been developed to guide Class B and C dam owners through the process of annually updating and testing their EAPs. Go to www.des.state.nh.us/dam/eap for a description of the minimum requirements for any EAP document, including a sample flowchart, EAP template, state agency mailing addresses and other forms. There's also a description of the procedure for annual testing of your EAP.

When reviewing and updating your EAP, please note that the emergency contact number for the DES Dam Bureau has changed and is now (603)639-6982.

Of course for those of you who do not have internet access, or those who prefer the good old fashioned method of communication, we're always available to talk with you on the telephone or meet with you in the office. Feel free to call Bethann McCarthy, at (603)271-3406, if you have any questions about updating or testing your EAP.

We Want Your Input!

By Nancy McGrath

Enclosed in this newsletter is a questionnaire we are asking you to fill out. The answers to our questions will greatly assist us in serving you better. We appreciate the time and effort this will take! If you have any questions you may contact us at (603)271-3406 or damsafety@des.state.nh.us . Please return by mail or fax (603)271-7894.

Proper Slope Protection on Dams

By Amy Clark

Dam owners are often asked to provide erosion protection for the slopes of the slopes of their earthen embankments. This is because upstream slopes are susceptible to wave erosion and downstream slopes are susceptible to rainfall runoff and/or tailwater erosion.

Repeated wave action against the upstream embankment erodes the fill material and can lead to sloughing of the slope, which can extend into the crest of the dam. The amount of protection needed depends on expected wind velocities, boating activities, steepness of the embankment slope and permanent pool elevations (protection is generally not needed below the permanent pool elevation). Properly placing riprap- a blanket of graded rock- in the areas subject to wave erosion is generally an effective way to protect the upstream slope. The maximum rock size and weight should be large enough to withstand the energy caused by wave action. If the stone is sized too small, it will eventually wash away.

To protect the downstream slope from rainfall, typically a hearty vegetative cover is all that is needed. To properly maintain a quality cover, a 3:1 slope (3 horizontal on 1 vertical) or flatter is desired because it is about the steepest slope on which mowing equipment can operate efficiently. If the embankment is steeper, a seeded erosion control mat may be needed. If the downstream slope is exposed to tailwater, wave erosion may occur along the surfaces of the tailwater. In these cases, upstream slope protection methods can be applied to protect these areas.

If a sever erosion problem exists or it is a reoccurring problem, a dam owner may want to hire a professional engineer to design a more effective slope protection.

Do You Need a Wetlands Permit to Rip Rap the Upstream Face of Your Dam?

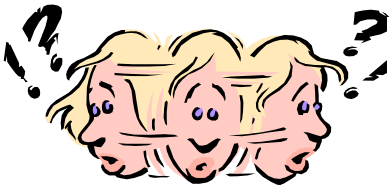
By Sandy Crystal, Wetlands Bureau

Yes, the landowner needs a wetlands permit to conduct most work within the banks of a water body, as well as within the surface waters, wetlands, etc.

The type of wetlands application for the project depends on the location and extent of work. If the work is a maintenance activity (such as replacing existing rip rap), the “Minimum Impact Expedited” application is the appropriate application to submit. If the work is new, the Wetlands Bureau’s “Standard Dredge and Fill” application may be the appropriate application to use for this project. Landowners may find it necessary to hire a professional to evaluate the need for and type of stabilization, determine the materials and construction methods to be used, and develop plans for the work.

Prospective applicants may obtain applications and other informational materials from the DES Wetlands Bureau’s website, www.des.state.nh.us/wetlands or call the Bureau at (603) 271-2147. If the landowner or consultant would like additional information, she or he may arrange for a preapplication meeting in Concord with the assigned DES wetlands permitting inspector. At such a meeting, the landowner would bring available information relevant to the proposed work and the permitting inspector would review the information and provide some advice and direction on what is needed to obtain a permit for such a project.

Information needed for Wetland applications typically include tax map, a copy of the section of the appropriate USGS topographic map, plans showing the proposed work, and photographs of the area where the work is proposed. Applicants for wetland permits are advised to plan ahead to allow time for the permitting process.



So just what is a "Great Pond" anyway?

By Mark Stevens

State statutes define a public water (Great Pond) as: *I. All natural bodies of fresh water situated entirely in the state having an area of 10 acres or more are state-owned public waters, and are held in trust by the state for public use; and no corporation or individual shall have or exercise in any such body of water any rights or privileges not common to all citizens of this state; provided, however, the state retains its existing jurisdiction over those bodies of water located on the borders of the state over which it has exercised such jurisdiction*. (RSA 271:20)

For dam owners, one of the key phrases used in this statute is "natural bodies of fresh water…" Since a water body that is impounded by a dam is not entirely "natural" it may not be a Great Pond or public water under this statute regardless of its size. However, if a naturally occurring lake or pond of greater than 10 acres existed prior to the construction of the dam, then most likely it is a Great Pond, even if the dam now regulates the water body at a size less than 10 acres. While this distinction seems simple enough, it is often very hard to tell what the size of impoundment behind the dam was prior to dam construction, years of operation, and outlet dredging, etc. Since some of these dam sites have been actively dammed for hundreds of years, a significant amount of research may be necessary to uncover historic records of the lake size and conditions that existed before the outlet of the water body was altered.

DES estimates that there are nearly 1,000 lakes or ponds in New Hampshire that are 10 acres or more in size.

Of these, roughly 700, (or 70%) are great ponds. Of these great ponds, about 330 are still in their "natural condition" with no dams at their outlets.

Dam Security

By Nancy McGrath

Since the last newsletter, the U.S. Office of Homeland Security has raised the terrorism alert to High Risk (Orange) twice. Dams have specifically been mentioned as possible targets in some of the past notifications. Although we addressed the security issue for dams in our last newsletter, we feel it is an issue that is always important for owners to be aware of. The importance of knowing who is near or on your dam rises in this heightened alert state, especially if you own a Class B (Significant Hazard) or Class C (High Hazard) dam.

During High and Severe alerts you should consider restricting access to your dam site to essential individuals only and always know where your EAP is.

Funding Opportunities for Dam Removal

By Stephanie Lindloff

Do you own a dam in the Upper Connecticut River watershed, in the Coastal area or in the Merrimack River watershed? Are you interested in exploring the option of dam removal to eliminate your financial burden of dam ownership, and to help restore New Hampshire Rivers?

If so, please contact Stephanie Lindloff, DES River Restoration Coordinator at (603)271-3406 or slindloff@des.state.nh.us. There may be funding available from federal and private sources for projects in these parts of the state -- funding that can greatly reduce your costs of dam removal. Our River Restoration Program can also help you through the process of planning and permitting the project. Contact us for more information.

Dam Removals This Summer

By Stephanie Lindloff

Interest in selective dam removal continues to increase statewide. Two dams are slated for removal this summer in New Hampshire.

The **Bearcamp River Dam in South Tamworth** is a privately-owned dam comprised of eight, 20-foot high concrete piers. Despite the fact that the dam's wooden spillway was removed over 30 years ago, large amounts of wood debris trapped behind the piers continue to be a safety hazard. Removal of the obsolete dam will restore 28 miles of the Bearcamp River to free-flowing condition for the first time in 75 years, benefiting wild trout populations and landlocked Atlantic salmon migrating into the river from Ossipee Lake.

Built in 1929, it is an Ambursen-type dam, designed by Massachusetts Institute of Technology professor W.A. Liddell and built by Ira W. Jones of Milton, N.H., a noted designer and builder of waterpower facilities in the early 20th century. Albert Farwell Bemis used the dam to manufacture architectural millwork, experimental and prefabricated housing and other wooden products, including toys. The N.H. State Historic Preservation Officer has determined the dam to be historically significant and plans are underway to develop interpretive signage at the site to honor the role and construction of the dam.

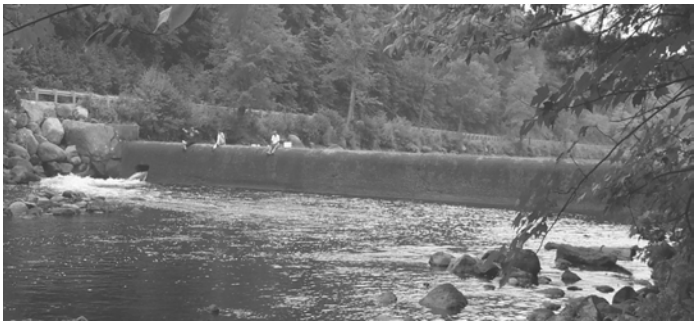
The removal of the dam is estimated to cost $124,000 and is funded by the following partners: Northeast Utilities Foundation/Public Service of New Hampshire, U.S. Fish and Wildlife Service, FishAmerica Foundation, Norcross Wildlife Foundation, DES, N.H. Fish and Game Department, Trout Unlimited and the private dam owner.

Bearcamp River Dam, South Tamworth. Photo: DES Dam Bureau

The **West Henniker Dam on the Contoocook River** is an 18-foot high, concrete ogee spillway dam that is owned by the Town of Henniker. Rather than spending a considerable amount of money to upgrade their spillway capacity, the town has decided to remove the obsolete dam. This will eliminate their financial and legal burden of dam ownership on a beautiful stretch of river that is much frequented by whitewater paddlers and anglers. Restoring the river is also a catalyst for the revitalization of a nearby Brownfields site into a community riverfront park. Soil contamination on the site of the former paper mill (that utilized the dam until the late-1980s) is also expected to be cleaned up this summer.

The current dam was built in 1936, but earlier dams existed in the area dating back to the 1780s. The dam and Brownfields site are part of West Henniker Village, which was recently determined by the N.H. State Historic Preservation Officer to be historically significant as a district. Initial ideas to memorialize the site's long history include developing an interpretive trail at the proposed riverfront park, which would document the history of the mill property, the associated 2,000 foot-long canal and the dam itself.

The dam's removal is estimated to cost $160,000 and is funded by the following partners: DES, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, NOAA Restoration Center, N.H. Fish and Game Dept., FishAmerica Foundation, Wildlife Forever, Norcross Wildlife Foundation, American Rivers, American Whitewater, Trout Unlimited-Basil Woods Chapter and the Town of Henniker.



West Henniker Dam, Contoocook River, Henniker. Photo: DES Dam Bureau

DES - DAM BUREAU STAFF

Dam Bureau Administration
Jim Gallagher, PE - Chief Water Resources Engineer
Julie Lockwood - Administrative Assistant
Tina Cullen - Secretary

Dam Safety Section
Steve Doyon, PE - Administrator
Grace Levergood, PE -Civil Engineer
Dale Guinn, PE - Civil Engineer
Amy Clark, PE - Civil Engineer
Jeff Blaney - Civil Engineer
Stephanie Lindloff – River Restoration Coord.
Nancy McGrath - Outreach Coordinator
Wendy Stout - Executive Secretary

Dam Maintenance Section
Jimmy Leung, PE - Administrator
Richard DeBold - Civil Engineer
Bethann McCarthy, PE - Civil Engineer
Dan Mattaini, PE - Civil Engineer
Gail Timmins - Executive Secretary

Project Development Section
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Tim Carney, PE - Project Engineer
Mark Stevens, LLS - Land Agent
Pat Bell - Engineering Technician
Ed Kirpolenko - Engineering Technician
Robert Fay – Winnipesaukee Proj. Operator
David Chappell – Pittsburg Project Operator

Construction Crew - Maintenance
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John Collins
Donald Corliss
Michael Courser
William Haskell
Craig Thoroughgood

Dam Operators - Maintenance
Peter Ames
Andrew Stout
Carey Timmins

SPRING/SUMMER 2003
DAM SAFETY UPDATE

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Water Division

Keeping dam owners up-to-date on various topics of dam ownership

State of New Hampshire
Department of Environmental Services
Water Division
6 Hazen Drive, PO Box 95
Concord, NH 03302-0095

State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES
6 Hazen Drive, P.O. Box 95, Concord, NH 03302-0095
(603)-271-3406 FAX (603)-271-7894

Dear Dam Owner: _____
Dam Owners Name Optional

Please answer the following questions and return it by mail or fax (603-271-7894). In supplying us with this information, you will help us to provide better service. We appreciate your time and effort.

1) We have heard from several dam owners who have either been denied insurance for their dams or have seen their insurance premiums rise dramatically. Do you have insurance on your dam? If yes, with what company did you obtain it? If no have you attempted to obtain it and been denied?

2) What is the tax map and lot number for the property on which your dam is located? Please indicate the dam#.

3) Approximately how many hours per month do you spend on dam related activities; inspecting, maintaining, record keeping, etc?

4) As a dam owner, are there any particular issues or responsibilities that give you difficulty?

5) Do you feel that you had adequate information about the legal and financial responsibilities of dam ownership prior to purchasing or building your dam?

6) Are you interested in learning more about the option of dam removal and river restoration?

7) Do you feel this newsletter keeps you informed of maintenance and other dam related issues?

8) Are there any topics you would like to have covered in future newsletters?

9) Would you be interested in attending a local two-hour dam maintenance seminar? If yes, what time is better; weekday or weekend, daytime or nighttime?

Please fold in thirds
Fold this section up first
Fold bottom section over middle
Tape together
Place stamp and send back

THANK YOU!

SPRING/SUMMER 2003 DAM SAFETY UPDATE QUESTIONNAIRE

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Water Division

Keeping dam owners up-to-date on various topics of dam ownership

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State of New Hampshire
Department of Environmental Services
Water Division, Dam Bureau
6 Hazen Drive, PO Box 95
Concord, NH 03302-0095

PLEASE PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ENVIRONMENTAL SERVICES
WATER DIVISION, DAM BUREAU
PO BOX 95
CONCORD, NH 03302-0095